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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,897	11/20/2003	Shao-Chung Hu	JCLA11797	1661
23900	7590	08/31/2005	EXAMINER	
J C PATENTS, INC.			ROSE, KIESHA L	
4 VENTURE, SUITE 250			ART UNIT	
IRVINE, CA 92618			PAPER NUMBER	
			2822	

DATE MAILED: 08/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/718,897

Applicant(s)

HU ET AL.

Examiner

Kiesha L. Rose

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the amendment filed 21 June 2005.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 15-17 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Morrow et al (U.S. Publication 2004/0058547).

Morrow discloses an integrated circuit interconnect (Figs. 2I, 2O and 2Q) that contains a first dielectric layer (210) having a first opening therein, a first metal layer (224) formed in the first opening and comprising copper, a first protective layer (230) formed on the surface of the first metal layer not covered by the first dielectric layer, a first stop layer (234) on the surface of the first dielectric layer with the opening formed in the first dielectric layer and the first stop layer, a second dielectric layer (236) formed over the first dielectric layer, a second metal layer (252) filled in the second opening comprising copper, a second protective layer formed on the surface of the second metal layer not covered by the second dielectric layer and a second stop layer on the surface

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of the second dielectric layer wherein the opening is formed in the second dielectric layer and the second stop layer, wherein the first protective layer and second protective layer are formed from a mixture of the first and second metal layer and a first and second film layer (226/232) that is conductive or non-conductive and where the first film layer is reactive with the first and second metal layers but non-reactive with the first and second dielectric layers. (Figs. 2h-2j, Page 3, Paragraph 25)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 18-20 and 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morrow in view of Maiz (U.S. Patent 6,794,755).

Morrow discloses all the limitations except for the second dielectric layer having a second opening cutting through the first protective layer. Whereas Maiz discloses an integrated circuit interconnect (Fig 2G) that contains a first dielectric layer (210) having a first opening therein, a first metal layer (224) formed in the first opening and comprising copper, a first protective layer (218) formed on the surface of the first metal layer not covered by the first dielectric layer, a first stop layer (244) on the surface of the first dielectric layer with the opening formed in the first dielectric layer and the first stop layer, a second dielectric layer (246) formed over the first dielectric layer with a second

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opening cutting through the first protective layer to expose the first metal layer, a second metal layer (280) filled in the second opening comprising copper, a second protective layer formed on the surface of the second metal layer not covered by the second dielectric layer and a second stop layer on the surface of the second dielectric layer wherein the opening is formed in the second dielectric layer and the second stop layer. (Damascene formed has more than one interconnect level and can be repeated. (Column 7, lines 53-55) The second dielectric layer has a second opening cutting through the first protective layer to provide electrical connection between the first interconnect and the second interconnect. (Column 10, lines 10) Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Morrow by incorporating the second dielectric to have a second opening to cut through the first protective layer to provide electrical connection between the first interconnect and the second interconnect as taught by Maiz.

Response to Arguments

Applicant's arguments with respect to claims 15-23 have been considered but are moot in view of the new ground(s) of rejection. In regards to the new limitation the first and second protective layer mixed with the first and second metal layers and a first and second film layer, where the film layers react with the metal layers but does not react with the dielectric layer, this limitation is shown in Figs. 2h-2j and shows that the protective layer is only formed over the metal layers.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiesha L. Rose whose telephone number is 571-272-1844. The examiner can normally be reached on M-F 8:30-6:00 off 2nd Mondays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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KLR


AMIR ZARABIAN
PATENT EXAMINER
TECHNOLOGY CENTER 2800